

THE FOLLOWING IS CLAIMED:

1. A method for treating an electrically conductive surface comprising:
contacting at least a portion of the surface with a first medium having a basic pH and substantially free of chromates and comprising at least one silicate wherein said at least one silicate has a ratio of SiO₂ to metal oxide of less than about 3:22,
drying the surface,
rinsing the surface, and;
contacting at least a portion of the surface with a second medium comprising at least one siliceous material.
2. An aqueous medium for use in electrically treating a metallic surface comprising a combination comprising at least one polar carrier, at least one oligomeric silicate soluble within said carrier, colloidal silica, and wherein the medium has an acidic pH and is substantially free of chromates.
3. A method for treating a metallic or an electrically conductive surface comprising:
exposing at least a portion of the surface to a first medium comprising a combination comprising at least one polar carrier and at least one oligomeric silicate that is soluble within said carrier wherein said medium has a basic pH, and;
exposing at least a portion of the surface to a second medium comprising colloidal silica and having an acidic pH.
4. The method of Claim 1 wherein the first medium comprises sodium silicate having a SiO₂wt./Na₂O ratio of about 2.
5. The method of Claim 1 wherein the surface comprises at least one member selected from the group consisting of copper, nickel, tin, iron, zinc, aluminum, magnesium, stainless steel and steel and alloys thereof.

6. The method of Claim 1 wherein the siliceous material comprises colloidal silica.
7. The method of Claim 1 wherein at least one of the first and second mediums further comprise at least one dopant selected from the group consisting of zinc, cobalt, molybdenum and nickel.
8. The method of Claim 1 wherein prior to contacting with said second medium the metal surface is dried at a temperature of at least about 120C.
9. The method of Claim 1 further comprising applying at least one coating upon the treated surface.
10. The medium of Claim 2 wherein the medium comprises greater than 1 wt.% of said at least one silicate and further comprises at least one dopant selected from the group consisting of cobalt, nickel, molybdenum and zinc.
11. The method of Claim 1 wherein said metallic surface comprises zinc.
12. The medium of Claim 3 wherein at least one of said first and second mediums further comprise at least one water soluble compound selected from the group consisting of from the group of titanium chloride, tin chloride, zirconium acetate, zirconium oxychloride, calcium fluoride, tin fluoride, titanium fluoride, zirconium fluoride; ammonium fluorosilicate, aluminum nitrate; magnesium sulphate, sodium sulphate, zinc sulphate, copper sulphate; lithium acetate, lithium bicarbonate, lithium citrate, lithium metaborate, lithium vanadate and lithium tungstate.
13. The method of Claim 1 wherein said first medium comprises an electrolytic environment wherein the metallic surface comprises the cathode.
14. The method of Claim 1 further comprising rinsing the metal surface, prior to contacting with said second medium, with a solution comprising water and at least one dopant.

15. The method of Claim 14 wherein the dopant comprises at least one member selected from the group consisting of molybdenum, chromium, titanium, zircon, vanadium, phosphorus, aluminum, iron, boron, bismuth, gallium, tellurium, germanium, antimony, niobium, magnesium, manganese, zinc, aluminum, cobalt, nickel and their oxides and salts.

16. The method of Claim 3 further comprising, prior to said exposing to the first medium, contacting said surface with at least one member selected from the group consisting of acid and basic cleaners.

17. The method of Claim 3 wherein said first medium comprises an electrolytic environment and said second medium comprises an electroless environment.

18. The method of Claim 9 wherein said coating comprises at least one member chosen from the group of latex, silanes, epoxies, silicone, amines, alkyds, urethanes, polyester and acrylics.